

University of Bahrain
College of Information Technology
Department of Computer Engineering
ITCE 341: Introduction to Microprocessors
FINAL: Semester 2, 2008-2009

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Date: June 17, 2009	Student Name:
Time: 2 Hour	Student ID No:
Section No:	Department: CE

Make sure you have 9 pages with 6 questions

Question	Points	Grades
Question1	16	
Question 2	14	
Question 3	12	
Question 4	18	
Question 5	20	
Question 6	20	
Total	100	

Notes:

- 1. Cellular Phone is not allowed**
- 2. Answer should be in blue pen**
- 3. Follow instruction when answering each questions**
- 4. Show your work**

Q1) Answer the following on IEEE 754 standard floating number for the given number 'C1F70000H'

a- Present the number in IEEE 754 standard floating point format

Sign-bit =

Exponent =

Significant =

b- Convert the given number in standard IEEE 754 floating point into decimal representation

c- Which portion of IEEE representation is responsible for increasing the accuracy?

d- Which portion of IEEE representation is responsible for increasing the value of the number?

e- How the value (- **infinity**) is represented on IEEE 754 single precision format



Q2) 8 kByte ROM is to be interfaced with 8088 μ P at physical location E7000H:

- a) How many address pins has this ROM?
- b) What is the starting address and ending address?
- c) Draw the complete interface circuit diagram with the ROM.



Q3) Answer the following on Protected Mode Memory Physical address representation, such that:

Assume a memory segment (data segment) has a base address: 12345678H

Limits: 1ABCD

with G=1

Assume the memory address is located in Global descriptor table at address 64₁₀ with 00 privilege mode in segment descriptor

a- Determine the maximum memory segment address (segment end address):

b- Determine the segment descriptor value (in HEX):

DS =

c- What is the size of this memory segment?



Q4) Assume the following memory contents:

09A0:0000	C5	67	A5	00	12	BC	34	BB	F4	72	09	A3	29	01	D4	CE
09A0:0010	FE	89	02	D8	A4	8A	7C	DD	90	3C	9B	83	65	19	F6	8A
09A0:0020	A7	CC	9A	BD	8E	90	2C	00	1C	90	0E	13	8C	39	58	C6
09A0:0030	76	D7	CA	FF	D8	71	18	24	40	A8	2C	76	93	C5	06	9E
09A0:0040	82	A6	54	2E	9A	20	0A	98	E4	A0	0E	25	38	29	2C	86

- Assume the following register contents:

DS: 09A2, SS: 09A0, ES: 09A3, CS: 09A4, BX= 000F, BP: 0012, SI: 0008, DI: 0004, CX: 0002, AX=0018

Give the final value of the affected register/memory, assume every question is independent than the other one:

a-

mov CX, ES:[BX+3]

b-

mov BX, [BP-2]

c-

CLD

REP movsb

d-

cmp DI, SI

jC NEXT

TAKEN

NOT TAKEN

CF=

SF=

OF=

ZF=



Q5) Given a BIOS portion of the IBM PC:

<u>IP</u>	<u>Object Code</u>	<u>Source Code</u>
E06C	2EFE4E7C	FILLIN-1
-----	-----	-----
-----	-----	-----
E072	FILLIN-2	LEA AX, [DI-82] ; assume DI = FFA5
-----	-----	-----
-----	-----	-----
E0A7	E8FA00	FILLIN-3
-----	-----	-----
-----	-----	-----
E084	FILLIN-4	GO: MOV [DI-72], FA23
-----	-----	-----
-----	-----	-----
-----	-----	-----
E0D1	FILLIN-5	NEXT: LOOP NEXT
-----	-----	-----
-----	-----	-----
EA12	FILLIN-6	JMP GO

Complete all the FILLIN based on program Instructions or Codes? Also complete the number of cycles for FILLIN-1

FILLIN-1:

number of cycles:

FILLIN-2:

FILLIN-3:



FILLIN-4:

FILLIN-5:

FILLIN-6:



Q6) Write an assembly language program that asks you: **Enter a decimal digit (0 – 9)** and displays its ASCII code.

Notes and Hints:

1. Use INT 16h for entering digits.
2. Use INT 21h, AH=9 to display the message **Enter a decimal digit (0 – 9)**.
3. Use INT 21h, AH=2 to display a digit.
4. The program must only accept a decimal digit. If any other character is entered, the message **Enter a decimal digit (0 – 9)** should be displayed again.
5. The ASCII code of a decimal digit N is 3N. For example, if you enter 5 then 35 is displayed.
6. Pressing **Esc** key (its ASCII code=1B) can only exit the program.

